REMARKS

Claims 9, 13, 14 and 17-19 are pending. By this Substitute Amendment, which replaces the June 19, 2003 Amendment After Final Rejection, the drawings are corrected pursuant to the attached drawing sheet, claims 9 and 18 are amended. No new matter is added by any of these amendments.

Applicants gratefully acknowledge that the Final Office Action indicates that claims 13, 14 and 17 are allowed. However, Applicants assert that all pending claims are allowable for the reasons discussed below.

Reconsideration based on the following remarks is respectfully requested.

I. The Amendment Complies with Final Rule Requirements

The Notice of Non-Responsive Amendment [*sic*, should be "Non-Compliant"] declared the June 19, 2003 Amendment After Final Rejection to be non-compliant under 37 CFR §1.121 Final Rules amended June 30, 2003 (see 68 *Fed. Reg.* 38611) and adopted effective July 30, 2003.

Applicants respectfully point out that the Final Rules became effective after the June 19, 2003 Amendment was filed. Nonetheless, the resubmitted amendments to the claims are provided to include the status of previously cancelled claims 15 and 16. Accordingly, Applicants respectfully request entry of this Substitute Amendment.

Because these amendments are resubmitted within the one-month period from the mailing of the Notice, no further Petition for Extension of Time is required.

II. The Application Contains No New Matter

The Advisory Action asserts that the June 19, 2003 Amendment to claim 19 (resubmitted in the present Substitute Amendment) introduces new matter. This assertion is respectfully traversed.

Claim 9 was previously amended to incorporate features "the first and second separators each are divided into a second plurality of spaced plates in contact with the divided electrode plates", and claim 18 with "divided first and second separators" was similarly amended. These features are supported in the specification at page 9, lines 8-29 (as originally filed, corresponding to page 10, line 6 through page 11, line 4 of the July 10, 2002 substitute specification) and Fig. 3. No new matter was introduced by the June 19, 2003 Amendment or in the present Substitute Amendment.

III. The Drawings Satisfy All Formal Requirements

The Final Office Action objects to the drawings based on informalities. Figure 1 is corrected replaced pursuant to the attached drawing sheet. Formal Drawings will be filed upon Notice of Allowance. Withdrawal of the objection to the drawings is respectfully requested.

IV. Claim 9 Satisfies the Requirements under 35 U.S.C. §112, second paragraph

Claim 9 is rejected under 35 U.S.C. §112, second paragraph, as being indefinite. Claim 9 has been amended to obviate this rejection. Withdrawal of the rejection under 35 U.S.C. §112 is respectfully requested.

V. Claims 9, 18 and 19 Define Patentable Subject Matter

The Final Office Action rejects claims 9 and 18 under 35 U.S.C. §102(b) over Japanese Patent Publication 06-052881 to Shimozu *et al.* (Shimozu). This rejection is respectfully traversed.

Shimozu does not teach or suggest a fuel cell including at least a cell function assembly including a single electrolytic membrane, a pair of electrode plates assembled in contact with opposite surfaces of the single electrolytic membrane, a first separator in the form of a flat plate made of an insulation material and formed with a first plurality of conductive projections in contact with one of the electrode plates to form a reaction chamber

to be supplied with fuel gas, a second separator in the form of a flat plate made of an insulation material and formed with a second plurality of conductive projections in contact with the other electrode plate to form a reaction chamber to be supplied with oxidizing agent gas, and a set of current-collecting plates assembled respectively in contact with the first and second separators at opposite outermost sides of the cell, wherein the electrode plates each are divided into a first plurality of spaced plates in contact with the single electrolytic membrane, wherein the first and second separators each are divided into a second plurality of spaced plates in contact with the divided electrode plates, and wherein the current-collecting plates each are divided into a third plurality of spaced plates in contact with the divided separators, as recited in claim 9.

Similarly, Shimozu fails to teach or suggest a fuel cell including at least a cell function assembly including a single electrolytic membrane, a pair of electrode plates assembled in contact with opposite surfaces of the single electrolytic membrane, a first separator placed in contact with one of the electrode plates to form a reaction chamber to be supplied with fuel gas, a second separator placed in contact with the other electrode plate to form a reaction chamber to be supplied with oxidizing agent gas, and a set of current-collecting plates assembled respectively in contact with the first and second separators at opposite outermost sides of the cell, wherein the electrode plates each are divided into a first plurality of spaced plates in contact with the single electrolytic membrane, the first and second separators each are composed of a perforated flat plate made of an insulation material and a plurality of conductive projections assembled with a plurality of mounting holes formed in the flat plate and placed in contact with the divided electrode plates, and the current-collecting plates each are divided into a second plurality of spaced plates placed in contact with the divided first and second separators, as recited in claim 18.

Instead, Shimozu discloses a solid electrolyte fuel cell assembly that is composed of a cell frame portion 6 in the form of a square flat plate and a plurality of unit cells 1 assembled with the cell frame portion 6 in such a manner that the adjacent unit cells 1 are arranged to be connected with each other in different polarity. Specifically, Shimozu teaches that unit cells 1 are each composed of a solid electrolyte membrane 4 and a pair of electrode membranes 2 and 3 placed in contact with opposite surfaces of the electrolyte membrane 4, and a current-collecting plate 5 is assembled in contact with each electrode membrane 3 of the unit cells 1. See paragraph [0016] and Figs. 1 and 2 of Shimozu.

Shimozu further teaches a plurality of the electrolyte fuel cell assemblies 9 are stacked through a plurality of gas passage members 11, 18 and 20. The gas passage members 11, 18 and 20 are each composed of a plurality of separators 13 assembled with a square frame portion 12. The separators 13 are each formed with a plurality of spaced projections 15 for electron passages which are placed in contact with the unit cells 1 See paragraphs [0017]-[0020] and Figs. 4, 5, 7, 8 and 11-13 of Shimozu.

In Shimozu, the plural electrolyte members 4 in the electrolyte fuel assembly are placed in contact with the electrode membranes 2 and 3 at their opposite surfaces and assembled with the cell frame portion 6. In such a construction of the fuel cell assembly, the split number of unit cells 1 must be increased for discharge of electric current at a high voltage. Accordingly, the number of the cell frame portions and fuel passages must be increased corresponding to the increase of the split number of the unit cells 1. As a result, the fuel cell assemblies become complicated within construction of the cell frame portion 6, and thus made difficult for small sizes in a stacked condition.

In contrast with the fuel cell assembly of Shimozu, the fuel cell as provided in the claimed features is characterized by the plurality of divided electrode plates placed in contact with the single electrolyte member and that the plurality of divided separators are placed in

contact with the divided electrode plates at one side thereof. The claimed fuel cell is further characterized by the plurality of divided separators being placed into contact with the divided electrode plates at one side thereof, and the divided current-collecting plates at the other side thereof. With such an arrangement of the divided electrode plates, even if the split number of the electrode plates, separators and current-collecting plates is increased for discharge of electric current at a high voltage, the claimed fuel cell can be provided in a simple construction having a small size.

The Final Office Action further rejects claims 9, 18 and 19 under 35 U.S.C. §103(a) over Japanese Patent Publication 05-074469 to Osuga in view of U.S. Patent 6,228,518 to Kindler, Japanese Patent Publication 61-284064 to Tsutsumi *et al.* (Tsutsumi) and U.S. Patent 4,648,955 to Maget. This rejection is respectfully traversed.

As admitted by the Examiner, Osuga does not disclose that the electrode plates are each divided into a plurality of spaced plates. Rather, Osuga teaches that the separators are divided into spaced plates, and the current-collecting plates are each divided into the plurality of spaced plates.

Maget, Tsutsumi and Kinder do not compensate for the deficiencies of Osuga. Instead, Maget discloses an arrangement of electrochemical cells 10, 12, 14 wherein the individual cells are arranged on a single electrolytic membrane 16 and contained within one chamber, with the cells electrically connected in series and/or in parallel. In such an arrangement of the electrochemical cells, the current is generated at a higher voltage, but may not be generated selectively at various voltages because the individual cells are electrically connected in series and/or in parallel. See col. 2, line 60 - col. 3, line 6, 40-52 and Figs. 1 and 2 of Maget.

In contrast with the electrochemical cells of Maget, the claimed fuel cell is characterized by the electrode plates and the current-collecting plates being divided

respectively into a plurality of spaced plates and electrically disconnected on the single electrolytic membrane. With such divided arrangement of the electrode plates and current-collecting plates, a large or small amount of electric current can be generated at desired lower or higher voltages by changeover operation of an external switch circuit adapted to the fuel cell.

Further, Tsutsumi discloses a current collector for a fuel cell wherein a current-collecting plate is divided into a plurality of spaced plates to avoid an efficiency decrease of current collection caused by distortion of the plates. See Abstract of Tsutsumi. However, Tsutsumi fails to disclose or suggest the electrode plates each being divided into a plurality of spaced plates in contact with the electrolytic membrane, as provided in Applicants' claimed features.

Kindler discloses a biplate in the form of a two-sided separator for preventing fluid communication between compartments of fuel cells. See col. 5, lines 46-64 and Fig. 2 of Kindler. However, Kindler does not teach or suggest the electrode plates being each divided into a plurality of spaced plates in contact with the single electrolytic membrane and with the separators each divided into a plurality of spaced plates in contact with the divided electrode plate, as provided in Applicants' claimed features. These reasons also apply to claim 19 by extension of dependence from claim 18.

For at least these reasons, Applicants respectfully assert that independent claims 9 and 18 are now patentable over the applied references. Dependent claim 19 is likewise patentable over the applied references for at least the reasons discussed as well as for the additional features recited therein. Consequently, all the claims are in condition for allowance. Thus, Applicants respectfully request that the rejections under 35 U.S.C. §§102 and 103 be withdrawn.

VI. Conclusion

In view of the foregoing amendments and remarks, Applicants respectfully submit that this application is in condition for allowance. Favorable reconsideration and prompt allowance are earnestly solicited.

Should the Examiner believe that anything further is desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact Applicants' undersigned representative at the telephone number listed below.

Respectfully submitted,

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JAO:GWT/gwt

Attachment:
Drawing Sheet Fig. 1

Date: November 6, 2003

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